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Survey of Pediatricians : What are the Criteria Used for Referral to Speech and Language Pathologists?

Janet Bradley

Abstract

SURVEY OF PEDIATRICIANS: WHAT ARE THE CRITERIA USED FOR REFERRAL TO SPEECH AND LANGUAGE PATHOLOGISTS?

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The purpose of the present research was to summarize from the pediatric literature the norms for speech and language development and to determine if the pediatrician is utilizing these norms as criteria for making referrals to speech and language pathologists. Research tends to show a discrepancy between the incidence of speech and language disorders and the rate of referrals made by physicians.

The methodology involved developing a three-part questionnaire to determine what screening instruments are being used in the pediatric office in regard to speech, language, and hearing, and what informal criteria are utilized for making referrals for a speech and language evaluation.

The data were tallied from the first two parts of the questionnaire. The data from the third part were analyzed statistically by computing the number of correct responses, as determined from the literature, to each item on the questionnaire. A binomial test was used to determine the proportion of correct responses to incorrect responses at the .05 level of confidence.

The results of Part A indicated that 27% of the pediatricians responding to the study used speech and

language screening instruments some of the time with preschool children. Results of Part B showed that 82% do hearing screening in their offices. Results of Part C showed that there were not more correct responses than incorrect responses at the .05 level of confidence on the questions dealing with referral criteria based on informal observation of developmental landmarks.

LOMA LINDA UNIVERSITY

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by

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A Thesis in Partial Fulfillment

of the Requirements for the Degree Master of Science

in Speech-Language Pathology

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Each person whose signature appears below certifies that this thesis in her opinion is adequate, in scope and quality, as a thesis for the degree Master of Science.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

THE NATURE AND SCOPE OF THE PROBLEM

One of the most notable human attributes is the ability to communicate verbally with the other members of society. Yet for numerous reasons, some understood and some not, there are children who do not acquire this skill in the same manner as their peers. For several reasons, it is very important that a speech and/or language disorder be detected as early as possible. First, language is the primary means by which social and interpersonal relationships are formed. Consequently, a child's social development may be jeopardized. Second, language is the major tool for instruction during school years. If a child has difficulty understanding or expressing language, he will be at a distinct disadvantage in academic achievement. Third, the language-disordered child develops language at a much slower pace than his peers so that as he grows older the gap widens between his chronological age and his language abilities. Because language is so basic to the child's cognitive and social development, early detection and intervention of speech and/or language disorders is imperative (Schwartz and Murphy, 1975).

Several studies deal with the incidence of speech and language disorders in children. A 1972 report by the National Institute of Neurological Diseases and Strokes (NINDS) estimates that not fewer than 1.5 million children

evidence some developmental failure in language acquisition. Most studies indicate a disorder prevalence between 5% and 15% of the childhood population (Bax and Hart, 1976; Butler, Peckham, and Sheridan, 1973; Godfrey and Ward, 1962; MacKeith, 1977; Richardson, 1964; Rose, 1970; Solomons, 1970; Stewart, 1969; Wyatt, 1965). A British study, however, showed that doctors refer only one child in 40 by age 7 (Butler et al., 1973).

Pediatricians are frequently asked to make judgments regarding a child's speech and language development. In many cases the pediatrician is the only professional a child sees during his preschool years; consequently his judgment becomes extremely important. It is not uncommon for a child to reach school age before a referral is made (Bain, 1977). Unfortunately, in many cases this is well past the optimal time for intervention.

Some writers recommend that each child be screened in the pediatric office at the age of 3 (Bailey, Kiehl, Loughlin, Metcalf, Jain, and Perrin, 1974; Bax and Hart, 1976; Frankenburg, 1973). A variety of screening instruments is available to the pediatrician or an assistant for use in the pediatric office (Fiedler, Lenneberg, Rolfe, and Drorbaugh, 1971; Frankenburg and Dodds, 1967; Frankenburg, van Doorninck, Liddel, and Dick, 1976; Knoblock, Pasaminick, and Sherard, 1966; Sheridan, 1975). If no formal screening

is done there are some significant developmental landmarks that should be monitored in conjunction with the child's physical examination (Brown, Darley, and Gomez, 1967; Eisenson, 1963; Frankenburg and Dodds, 1967; Friedman, 1975; Hixson, 1980; Knoblock et al., 1966; Leavitt, Gorman, and Harvin, 1963; Schwartz and Murphy, 1975; Solomons, 1970; Templin, 1963; Thorpe, 1974; Wyatt, 1965).

The Problem

The objectives of this study were (a) to summarize from the pediatric literature the most acceptable criteria for identifying children in need of speech and language evaluation, and (b) to find to what extent pediatricians use these criteria in making referrals. The importance of this study is that the information gained will help to design methods to facilitate early detection of speech and language disorders by pediatricians.

The Problem Statement

Two specific questions were investigated:

1. According to pediatric literature, what are the norms established for referring children to speech pathologists for evaluation?
2. To what extent are pediatricians in the San Bernardino-Riverside area using these criteria in making their referrals for evaluation?

Limitations and Delimitations

The research population was delimited to pediatricians of the San Bernardino-Riverside area. This was the geographical area conveniently available to the researcher. A concentrated effort was made to get responses from the majority of those surveyed since those pediatricians responding to the survey might be more concerned about speech and language than those who failed to respond. No attempt was made to determine the appropriateness of referrals that pediatricians actually made.

The selection of concepts from the literature presented potential for bias. However, information was sought in a large variety of professional publications and analytical procedures were designed to provide a fair estimate of a consensus of important norms appropriate for pediatric use.

Hypothesis and Assumptions

Hypothesis

There is a significant quantity of information in the pediatric literature over the past 15 years to suggest that pediatricians should be routinely monitoring a child's communicative abilities. It was postulated that there would be observable differences between the criteria used by pediatricians and those of the literature. However, the proportion of correctly used referral criteria would exceed the proportion of incorrectly used criteria at the

.05 level of confidence.

Assumptions

It was assumed that:

1. Pediatricians read or are aware of topics presented in the pediatric literature and thereby utilize the literature as a means of keeping up with current topics relevant to their profession.
2. The San Bernardino-Riverside situation is not unlike similar localities with respect to the conditions and variables being studied.
3. Pediatricians are in fact making referrals to speech pathologists or other professionals for evaluation and correction of speech and language disorders.

Definitions of Terms

Correct and Incorrect Response

A correct response is that response which compares with age norms of speech and language development as defined in the pediatric literature. Conversely, when the response does not compare with norms cited in the pediatric literature it is considered to be incorrect.

Language

Language is the content of communication. It can be receptive -- the ability to comprehend what is being said,

or expressive -- the ability to use adequate vocabulary strung together in a meaningful way.

Pediatrician

A pediatrician is a medical practitioner who specializes in that branch of medicine dealing with the care, development, and diseases of the child.

Pediatric Literature

Those journal articles that have been abstracted in the Excerpta Medicus-Pediatrics are those referred to as pediatric literature.

Speech

Speech is the manner in which a person communicates verbally. Included are the way the words are pronounced, the rate at which words are produced, how fluently the words are produced, and the quality of the voice.

Speech and Language Disorder

A speech and language disorder is evidenced by the child's inability to understand or decode what is said to him at a level appropriate for his age, or to express himself in a way similar to that of his peer group so that it adversely affects speaker or listener.

Speech Pathologist

A speech pathologist is one who has proper credentials

to make adequate diagnosis of communication disorders and to plan and administer an appropriate program of remediation.

Chapter 2

REVIEW OF THE LITERATURE

The literature was reviewed with special emphasis on the following areas: incidence of speech and language disorder, normal development of speech and language, disorders of speech and language, correlation of speech and language disorders with other developmental problems, description of developmental screening instruments cited in the pediatric literature, role of the pediatrician in screening for speech and language development, and suggested criteria for referral to speech pathologists.

Incidence

Studies of the incidence of speech and language disorders have been more thorough in British than in American studies. Bax and Hart (1976) studied a population of 250 children, including all persons under the age of 5 years within a London borough. Of all 4½-year-old children in their study, 5% showed language deficits as measured by the Reynell Scales.

In another study Butler et al. (1973) administered sentence repetition tests to 7-year-old children. This group was composed of all children born during the week of March 3-9, 1958 in England, Scotland, and Wales. Of the 14,064 persons in this study, 10% showed speech that was out of norm.

Stevenson and Richman (1976) studied the prevalence of language delay in a population of 3-year-old children using the Reynell Developmental Language Scales. Their sample included all children born in a particular London borough during the month of March, 1968. They found approximately 7% to have language deficits.

MacKeith (1977) indicated that 1% of all British children cannot talk when they enter school at age 5 and 3% of those who can talk have speech defects. Another British author (Rose, 1970) stated that 15% of all children aged 6 to 10 and 5% of all children aged 10 and 5% of all children aged 10 to 14 have speech defects. Neither of these researchers, however, cited studies as a basis for his estimates.

American authors have also given varying estimates of speech and language deficit prevalence among children. It is especially difficult to compare published estimates of the prevalence of speech and language disorders because the criteria used in determining the deficits are often not clearly stated. Furthermore, authors group data on speech, language, and hearing deficits differently.

Richardson (1964) estimated a 15% prevalence of speech or hearing defects in school-age children and a 5% prevalence of language disorders among preschool children. Wyatt (1965) found that 4-9% of all elementary school children with normal

to superior intelligence exhibited symptoms of speech and language disorder. Solomons (1970) cited a 1951 White House Conference report which stated that 5% of all children aged 5 to 21 had speech and language deficits. Stewart (1969) stated that American surveys of speech and language defects showed a high incidence (5 to 10%) but she cited no references or data to support this estimate.

An NINDB monograph (1968) divided speech and language deficits into four categories. This study stated that among American school children 4-6% had articulation disorders, 1% had voice disorders, 0.6-1% had rhythm disorders, and 5% showed "retarded speech" (delayed language?).

Of all the studies of speech and language deficits, British and American, only one compared referral rate by physicians to the prevalence of disorders. Butler et al. (1973) reported that, although 10% of the children in their study, have speech disorders, only 2½% had been referred for speech therapy by age 7.

Normal Development of Speech and Language

Language development has been outlined in British and American pediatric literature in some detail over the past two decades. For the purposes of this review, only the most commonly used American sources will be cited in describing speech and language development.

From birth to 6 months, the period is described as

"undifferentiated babbling". Speech sounds are randomly produced. Toward the sixth month the child begins to enjoy playing with his production (Brown et al., 1967). The period from 6 to 12 months is marked by his response to adult language such as "no-no," "bye-bye," "pat-a-cake," and his name (Brown et al., 1967; Hixson, 1980). An extremely important audiologic landmark is that by 8½ months, 90% of infants turn to voice (Frankenburg and Dodds, 1967). Expressively, the child begins to imitate the speech sounds he hears and begins to put sounds into syllables (Frankenburg and Dodds, 1967; Brown et al., 1967; Knobloch et al., 1966). His cry is well-differentiated, using it to communicate anger, hunger, pain, discomfort. He plays with sound in earnest and entertains his family with his babbling (Hixson, 1980).

At about 1 year, the child uses, consistently, his first recognizable word (Brown et al., 1967; Friedman, 1975). During the period between 1 and 2 years the child uses one word utterances to indicate a whole thought such as "chair" to indicate "This is my chair" (Hixson, 1980; Friedman, 1975). Early in the second year he may still be "jargoning" but using the intonation and inflection of conversational speech (Knobloch et al., 1966). By the time he nears 2 years of age, his receptive vocabulary consists of familiar objects from pictures, his environment, and

body parts, a total receptive vocabulary of between 250 and 400 words (Friedman, 1975; Hixson, 1980; Wyatt, 1965). He begins to join together two to three words consisting primarily of nouns, verbs, and adjectives or Agent-Action-Object structures (Friedman, 1975; Hixson, 1980; Frankenburg and Dodds, 1967; Schwartz and Murphy, 1975). He has an expressive vocabulary of 25 words (Brown et al., 1967).

By 2½, the child is able to use all vowels and about two-thirds of his consonants correctly (Templin, 1963). Between 2 and 3, the child starts to use verb tense markers, "helping verbs," and "modal verbs" (could, should, will, can, etc.). He develops negative forms and his speech is definitely socialized as a means of manipulating his environment (Brown et al., 1967; Hixson, 1980). By 3, he can respond to commands such as put the toy in, on, or under the table. He knows his sex, can give his full name, and can name five body parts (Leavitt et al., 1963; Frankenburg and Dodds, 1967; Thorpe and Werner, 1974). He uses plurals, personal pronouns, and verbs so that his grammatic structure in regard to the parts of speech is similar to that of adults (Frankenburg and Dodds, 1967; Thorpe and Werner, 1974; Templin, 1963). He has a receptive vocabulary of approximately 1,000 words (Wyatt, 1965). The 3½-year-old has mastered articulation of /m/,/n/,/ng/,/p/, /f/,/h/,/w/,/y/,/k/,/d/,/b/,/g/ (Wyatt, 1965).

The 4-year-old can give appropriate answers to such questions as: "What should you do if you're sleepy, hungry, or cold?" (Leavitt et al., 1963; Thorpe and Werner, 1974; Frankenburg and Dodds, 1967). He is developing subject-verb agreement, conjunctions, and the ability to correct grammatical errors. He is able to hold conversations in an adult-like manner (Hixson, 1980).

By age 5 the child has 80% correct articulation (Templin, 1963). He can tell his age, count ten objects, and describe his favorite TV program in some detail (Leavitt, 1963). He has approximately a 2,000 word receptive vocabulary (Eisenson, 1963; Solomons, 1970). The 5 to 6-year-old child has a mean sentence length of 4.5 to 6 words (Templin, 1963). By age 7 he can define words by function, knows what day of the week it is, and has attained mature articulation (Leavitt et al., 1963; Solomons, 1970).

Disorders of Communication

Speech and language disorders have been classified in the following way: (1) articulation of speech sounds, (2) the sounds of the voice (pitch, quality, and loudness), (3) the rhythm of connected speech, and (4) the use of speech for symbolic purposes (Burgi and Matthews, 1963). Since the development of speech and language is dependent upon hearing, that area is also highly important in the child's development.

According to Burgi and Matthews (1963), articulation

defects are the most common communication disorder in the child. This problem is evidenced by the child's inability to produce some of the sounds of language. Vowels are generally easier to produce and are subsequently misarticulated less often than the consonant sounds which require a greater degree of competence to produce. The child may omit the problem sound completely or may substitute another sound for it (Burgi and Matthews, 1963).

Voice disorders are not common in children except as associated with such organic disorders as cleft palate and cerebral palsy. When the pitch, quality, or loudness of the voice deviates from that of his peer group the child is considered to have a voice disorder (Burgi and Matthews, 1963). The domain of the pediatrician is to determine possible organic bases for voice disorders. Brown et al. (1967) describe the problems of velopharyngeal closure and their relationship to hypernasality.

Stuttering refers to problems with the rhythmic flow of speech that result in repetitions, prolongations, and hesitations. Most stuttering has its onset during the critical period of language development -- 2 to 5 years of age (Burgi and Matthews, 1963; Wyatt, 1965). Management of stuttering in the young child is generally preventive and directed toward the significant listeners in his environment (Brown et al., 1967; Burgi and Matthews, 1963).

Eisenson (1963) defines language as a system of symbols (spoken words, gestures, or written words) used for the purpose of communication. The manner in which this system of symbols is produced constitutes speech. Brown et al. (1967) state that language requires two basic skills: (1) the associating of a specific word with an object, act, or concept and (2) the ordering of words into phrases and sentences. Delayed language results in limited vocabulary, immature sentence structure, and inadequate idea formation (Burgi and Matthews, 1963). The child with disorders of language is characterized by inconsistency of response, hyperactivity, short attention span, and perseveration (Eisenson, 1963). Possible causes are retarded mental development, auditory defects, emotional distrubances, lack of motivation, unfavorable environmental conditions, and organic defects of the central nervous system (sometimes referred to as aphasia) (Burgi and Matthews, 1963; Eisenson, 1963; and Friedman, 1975).

During the first months, deaf children babble similarly to hearing children, but over time the babbling decreases. They do not engage in vocal play, they do not echo or imitate. The sounds that they do produce to attract attention may be of unusual quality (Brown et al., 1967). During the period of speech acquisition the child will fail to develop oral language (Eisenson, 1963). A fact of

significance to the pediatrician is that studies show children with histories of chronic otitis media do not acquire language at the same rate as matched control groups (Hixson, 1980; Holm and Kunze, 1969). Speech and language stimulation beginning during infancy is necessary for the hard-of-hearing child (Eisenson, 1963; Hixson, 1980; Marlow, 1973).

Correlation with Other Developmental Problems

In addition to the communication problems of the speech and language handicapped child, there is potential for other handicaps. Wyatt (1965) stated that a speech and language handicap may interfere with the social adaptation of the child. The speech development of the 3-year-old child may be an aid to identifiying children with other problems of development such as social, neurological, and psychological (Fiedler et al., 1971; Burgi and Matthews, 1963; Friedman, 1975).

More specifically, there is considerable evidence that the speech-handicapped child has significantly more difficulties in learning to read (Bax and Hart, 1976). Delayed speech and language can be an early indicator of learning disability (Rousseau, 1974). Butler et al. (1973) found that one-third of the children with marked speech defects were considered to be non-readers as compared with 2.8% of the controls.

Ingram (1963) studied 78 children aged 6 through 9 who were having difficulties learning to read and write. While motor development had been normal, their speech development had been slow. Approximately 58% had said their first words after 18 months of age, 35% after the age of 2 years, and 8% after the age of 3. One-third did not speak in phrases until they were over 3½ years of age.

For these reasons delayed speech should not be ignored in the hope that the child will grow out of it (Friedman, 1975). Frankenburg (1975) suggested that these children need to be identified as early as possible to prevent later school failure. He recommended that all children should be screened at 9 months, 3 years, and 5 years of age (Frankenburg, 1973). Bailey et al. (1974) recommended screening at age 3 and again at school entrance.

Description of Screening Instruments

Bayley (Damarin, 1978) designed a screening instrument known as the Bayley Scales of Infant Development. It consists of three parts: A Mental Scale, A Motor Scale, and an Infant Behavior Record. According to Damarin, the Mental Scale is made up of questions that measure response to visual and auditory stimuli, manipulation of play objects, and responses involving social interaction. Other items of the Mental Scale are those which measure

discrimination of shapes, memory or objects constancy, simple problem solving, naming objects, understanding prepositions, and the concept of the number one. He described the Motor Scale as consisting of items which measure gross and fine motor abilities. According to Damarin, the Infant Behavior Record rates aspects of personality, activity level, responses to objects, sensory areas of interest, and ego functions of attention, persistence, and endurance. These scales were standardized on a sample of 1,262 infants and children ranging from 2 to 30 months of age.

Frankenburg and Dodds (1967) developed a test known as the Denver Developmental Screening Test (DDST). They described the test as consisting of four areas: gross motor, fine motor-adaptive, language, and personal-social. According to Frankenburg and Dodds the items selected for the test were taken from 12 developmental and preschool intelligence tests. It was designed to be used with children from birth to 7 years. They noted that the test takes 10-20 minutes to administer and has been standardized on 1,036 normal children ages 2 to 6 weeks.

Later, Frankenburg et al. (1976) designed the Denver Prescreening Developmental Questionnaire (PDQ) for use as a periodic screening of all children 3 months to 6 years of age. According to these authors the PDQ is used to identify

children who need further testing. This test as described by Frankenburg et al. consists of parents completing the segment of the questionnaire appropriate to their child's age. Completion time is estimated by the authors as five minutes. Frankenburg et al. reported that the instrument was field tested in 1,027 physician's offices and public health clinics and that analysis yielded a predictive value of 24.7% for referral.

The Developmental Screening Inventory (DSI) is a test developed by Knoblock et al. (1966) and is based on the work of Gesell and Armatruda (1954). According to Knoblock et al., it consists of selected items from the Gesell Developmental Schedules in each of five areas: adaptive, gross motor, fine motor, language, and personal-social behavior indicating developmental landmarks at four week intervals from ages 1 to 18 months. They state that it has not been standardized but has been rigorously compared with other instruments to establish reliability and validity.

The Griffiths Scale is a published test that is described by Carr and Stephen (1964) as consisting of five scales: locomotor, personal-social, hearing and speech, eye and hand, and performance. They noted that 10 to 15 items cover each month age period and that it has been standardized on 604 infants aged 1 to 24 months.

Kulig and Baker (1975) published the Physician's

Developmental Quick Screen (PDQ). It is designed for use with children aged 6 months to 6 years and takes five minutes to administer. According to the authors it covers the disorders of language, articulation, voice, rhythm of speech, and the speaking mechanism using test forms age-graded in six month intervals. They validated the test on 105 children and the scores were compared with test scores from a total battery administered by speech pathologists. They found that there was 90% agreement between the PDQ and the total battery; under referral was 3%, over referral was 7%.

Lenneberg developed a Speech Evaluation Form to be used with 3-year-old children, which is described by Fiedler et al. (1971). The authors indicated that some sections are done by interview of parent or observation while others involve testing of the child. Ten sections deal with various aspects of language vocabulary, expression, comprehension, and articulation. Of 575 children given screening examinations, 9% were considered to have failed and were referred for evaluation. These authors reported that marked differences persisted between the group who passed and the group who failed the initial speech evaluation at age 3 on psychological and neurological follow-up through age 7.

The Stycar Language Test (Sheridan, 1975) was designed by a British pediatrician to be given to children aged 11

months to 7 years. There are three sections: common objects test, miniature toy test, and picture book test.

The Reynell Developmental Language Scales is a British test described by Johnson (1976) as consisting of two Verbal Comprehension Scales and an Expressive Language Scale. According to Johnson, it has been validated statistically. Its use appears to be limited to Britain since no American reference for its use were found.

The Gesell Developmental Schedules were described by Carr and Stephen (1964) as based on the observation of 107 infants of middle socioeconomic status. They were developed to cover ages 4 weeks to 6 years and include four areas: motor, adaptive, language, and personal-social. According to Carr and Stephen mean ages (in months) were determined for the various developmental levels in each area. The results of this test are thus expressed in terms of developmental age in each area.

Role of the Pediatrician

Parents frequently express their concerns regarding the child's communication development to the pediatrician first (Schwartz and Murphy, 1975). Lessler (1973) therefore suggests that the role of the pediatrician is much more than biological; it should include the educational, social, physical, and emotional aspects of the child's life. Since communication disorders can have a negative impact on the

child's life, the pediatrician needs to be aware of the resources available and have some understanding of the nature of these resources (Halfond and Olmsted, 1963).

Olmsted (1963) states that the pediatrician's primary emphasis has been placed on mental and motor disorders to the exclusion of the "devastating handicap" of communication disability.

According to Marlow (1973), a common practice is to refer to a clinical psychologist, thus language ability may not be satisfactorily differentiated from overall intelligence. In this case the child might be diagnosed as mentally retarded because of his verbal intelligence score.

In order for the pediatrician to be effective in handling problems of communication he needs to be aware of the nature of the development of the communication process and its relation to the development of the child, to be able to recognize the signs of communication disorder and to assess the consequences, and know when and how to get professional help for prevention or correction of communicative disorders (Lillywhite, 1963).

Preston (1973) warned against the "wait and see" attitude since valuable time may be lost. Burgi and Matthews (1963) suggested that an examination by a speech pathologist should be made to determine whether the child will "outgrow" his problem without treatment. It was the opinion of

Richardson (1964) that most of the school population with speech, language, or hearing problems had been brought to their pediatrician in regard to the problem and in many instances these problems should have been recognizable or preventable at an earlier age.

Criteria for Referral

Several writers have suggested behaviors that are indications for referral. Brown et al. (1967) indicated that the appearance of the first word beyond 18 months may indicate a handicap. Burgi and Matthews (1963), Brown et al. (1967), and Fiedler et al. (1971) suggested that if the child isn't using intelligible simple sentences by 30 to 36 months his physician should be concerned.

Marlow (1973) stated that a child with the following problems at age 2 should be referred for evaluation: (1) is not able to follow directions, i.e., "Give Mommy your shoes" (without gestural or visual cues); (2) doesn't respond consistently to sound or appears to need to be spoken to in a loud voice; (3) responds more consistently to gesture than to speech; (4) is not spontaneously using meaningful words.

Preston (1973) suggested that the first three years may be a crucial time for language development and listed some general questions to which "yes" responses might indicate evaluation: (1) Does the child exhibit reduced sensitivity to sound? (2) Does the child consistently misunderstand

speech directed to him? (3) Does the child produce irrelevant responses to speech directed to him? (4) Does the child have difficulty in expressing his thoughts, needs, and wants? (5) Does the child have difficulty in articulating his needs?

According to Marlowe (1973), the 3-year-old child whose speech is still largely unintelligible, who uses vowels primarily, omits consonants, or does not use sentences of three or more words should be referred. Echolalia may be present in young children as they imitate adult utterances; however, it should seldom occur past age 30 months (Drumwright, 1975).

The 5-year-old child who is still substituting sounds, who has impaired sentence structure, omits word endings, or is noticeably nonfluent should be referred (Marlowe, 1973).

The school-age child should be referred for any of the following reasons: he has any speech errors after age 7; he is embarrassed by his speech at any age; his voice is inappropriate in pitch, volume or quality (such as hypernasality, hyponasality, or inflection) for his age and sex; his speech contains unusual word orderings; or he has problems of rhythm or rate after 5 years of age (Marlowe, 1973).

Levine (1980) stated that any time there is a question of hearing deficit a careful history must be taken. Important

factors to consider are family history of congenital deafness, any questions of maternal infections or drugs taken during pregnancy, length of pregnancy, events surrounding the birth, and early postnatal history. He expressly cautioned against procrastination in ordering diagnostic tests.

Chapter 3

RESEARCH DESIGN AND PROCEDURES

This study is descriptive and comparative. It consists of an analysis of responses to a questionnaire developed by this researcher to survey the referral practices of pediatricians regarding children with suspected language and speech disorders. The sample surveyed was limited to pediatricians in the San Bernardino-Riverside area. Responses are categorized and compared to referral criteria found in the pediatric literature. Referral criteria in this study is based on normal acquisition of language and speech.

Population

A master list consisting of the names of 45 pediatricians was obtained from the pediatrics section of the classified section of phone directories representing the geographical areas surveyed. All primary care pediatricians were chosen as participants; those pediatricians listing subspecialties were excluded. The geographical area covered is largely urban with a population of approximately 500,000 people and contains two community colleges, three liberal arts colleges, two universities, and 12 major hospitals. It is believed that this population is not unlike that in many urban areas of the United States.

Materials and Sources

The questionnaire designed for this study is a checksheet

(See Appendix A) which is divided into three sections:

1. Section A is a list of 10 developmental screening tests that have been cited in the pediatric literature; namely, Bayley Scale, Denver Developmental Screening Test, Denver Prescreening Developmental Questionnaire, Developmental Screening Inventory, Griffiths Scale, Physicians Developmental Quick Screen (PDQ), Speech Evaluation Form, Stycar Language Test, Reynell Development Language Scale and Gesell Developmental Scale. These are developmental screening tests which have been designed for use with infants through preschool children. Four of these tests (Items 6 7, 8, and 9 on the questionnaire) are specifically designed for speech and language screening. The others are general developmental tests that include a section on speech and language acquisition. A line marked "other" (Item 11) for a fill-in response and a line marked "informal observation" (Item 12) are included to give the physician flexibility of response. The questionnaire was designed in such a way as to permit a response with respect to the frequency that the test is used, as shown by columns marked None (0%), Some (30%), Many (60%), Most (90%), and All (100%).

2. Section B was designed to ascertain the percentage of children referred for speech and hearing evaluation and the type of facility to which the child was referred. A third question asked whether the pediatrician performed any type of hearing screening test in his office and if so, the type of test usually performed.
3. Section C is a list of 18 observations of speech or language behavior that a parent or physician might make. It is arranged so that Items 1 through 4 refer to articulation skills, Items 5 through 14 cover language skills, Items 15 through 17 refer to hearing acuity, and Item 18 pertains to stuttering. The items were devised by taking the norms outlined in the literature and formulating a statement which would reflect a deficit or lack of acquisition of certain landmarks. Response columns were arranged in 12-month intervals ranging from 12 to 72 months of age. A column marked "not sure" was included so that the respondent would not be forced to make a guess.

Methodology

Each physician whose name occurred on the master list was assigned a number. This number was put on the questionnaire so that the respondent remained anonymous. When the

number was returned, the name was deleted from the data file. A cover letter introducing the project (see Appendix B) accompanied each questionnaire. A three-week time line was suggested at which time a second wave was mailed to those not responding. Originally a phone follow-up was planned, but time constraints for completing the project and decreasing returns from additional mailing suggested that further follow-up efforts to obtain returns would not significantly increase the sample size.

Chapter 4

RESULTS

Of 45 questionnaires mailed out, 23 were returned. One indicated that the physician was no longer in practice. This means that 22 responses were tallied -- a response rate of 50%. Only 6 physicians (27%) reported using tests specific to speech and language. Eight physicians used developmental tests which contain a speech and language component. Seven respondents reported that they did not do any type of screening other than observation and one reported that he did no screening or observation at all. The number of physicians using each screening instrument listed in Section A is shown in Table 1.

It can be seen from the table that the Denver Developmental Screening Test is the most frequently used test with 50% of the respondents reporting that they used it at least some of the time. The next most frequently used test is the Gesell Developmental Scale with seven reporting that they used it from some to all of the time. Bayley Scale, Denver Prescreening Developmental Questionnaire, and Physicians Developmental Quick Screen had four responses each. The "Other" column mentioned the Illingworth and the Denver Articulation Screening Exam (1 respondent each). Table 2 shows the number of screening instruments used by each physician. Eleven of the respondents used more than one instrument for screening.

Responses in Section B show that language, speech, and hearing clinics are the most commonly used resources for referral (See Table 3). The more frequent use of these resources may be explained by the fact that there are two university speech and language training clinics within the geographical area of this study.

The responses to Section B indicate that the majority of the physicians in this study (18 of 22 respondents) do hearing screening utilizing an audiometer. Five report doing tympanometry.

The results of Section C are tabulated in Table 4. An item by item statistical analysis of these responses is summarized in Table 5. For each item the proportion of correct responses ($\hat{p}$) was calculated by the formula: $\hat{p} = n_c/n_t$, where n_c = number of correct responses and n_t = total number of responses. Since there are only two possible outcomes of a response, correct or incorrect, the distribution of all possible combinations of proportions of correct responses is binomial.

A 95% confidence interval was also estimated for the $\hat{p}$ of each item. Whereas the $\hat{p}$ was calculated from sample data, the confidence interval estimates the range of values within which we can say, with 95% assurance of being correct, that the true $\hat{p}$ of the population lies. The size of this confidence interval diminishes as the size of the sample

Table 1. Tabulation of Responses to the Pediatric Speech and Language Referral Survey, Section A.

SCREENING INSTRUMENT	PROPORTION OF CASELOAD SCREENED				
	None	Some	Many	Most	All
	0%	up to 30%	up to 60%	up to 90%	100%
Bayley Scale	5	4	-	-	-
Denver Developmental Screening Test	1	9	3	-	-
Denver Prescreening Developmental Questionnaire	5	3	1	-	-
Developmental Screening Inventory	7	-	-	1	-
Griffiths Scale	8	-	-	-	-
Physicians Developmental Quick Screen (PDQ)	6	3	-	1	-
Speech Evaluation Form	7	1	-	-	-
Stycar Language Test	8	-	-	-	-
Reynell Development Language Scale	8	1	-	-	-
Developmental Schedule (Gesell)	4	3	-	2	2
Others: Unspecified	4				
Illingworth	-	1	-	-	-
Denver Articulation Screening Exam	-	1	-	-	-
Screening by observation in addition to other tests	1	1	1	2	7
No formal test, screening by observation only	-	-	-	-	7
No screening of any type	-	-	-	-	1

Table 2. The number of different screening instruments used by responding pediatricians who utilize formal tests.

NUMBER OF TESTS USED	NUMBER OF RESPONDENTS
1	3
2	5
3	2
4	3
5	0
6	1

Table 3. Tabulation of Responses to the Pediatric Speech and Language Referral Survey, Section B.

	0-5%	6-10%	11-15%	16-20%
1. % referred for speech and language evaluation	22			

	Private	Clinic	Pub. Sch.	Psych	Other
2. Where do you refer?	8	18	7	1	0

	Yes	No	No response
3. Do hearing screening?	17	3	1

Table 4. Tabulation of responses to the Pediatric Speech and Language Referral Survey, Section C.

SECTION C

Listed below are complaints that a parent might make or observations that a physician might note during an office visit. Please check the appropriate column to indicate at which age you would consider the following behaviors to warrant referral for a speech and language evaluation.

	12-24 mo.	25-36 mo.	37-48 mo.	49-60 mo.	61-72 mo.	72-up mo.	not sure
1. People can't understand what the child is saying.	2*	11	8				
2. Child doesn't say correctly simple words like man, boy, knee, pee.	3	7	10				
3. Child sounds mushy on words like chair, shoe, George, sauce.	1	4	10	6		1	
4. Child omits sounds from his words leaving mostly vowel sounds.	2	9	10			1	
5. Child doesn't name familiar objects in his environment.	5	12	4			1	
6. When spoken to, child doesn't recognize his name or names of family members.	14	7	1				
7. Child doesn't put words together to express his wants.		14	7		1		
8. Child uses telegraphic speech such as "go store" or "mommy cookie".		3	15	3	1		
9. Child uses unusual word order in sentences, such as "I not was working".		4	6	9	1	1	1
10. Child is unable to respond with his correct name when asked to do so.	6	9	5	2			
11. Child has difficulty following directions without cues, such as "Give mommy your shoes".	4	9	6	1	1		1
12. Child primarily gestures instead of speaking.	5	12	2	1	1		NR
13. Child uses only 3 or 4 words per sentence.		2	9	7	3		1
14. Child echoes everything that is said.	3	5	10	1	1		NR 1
15. Child appears not to hear noise such as the telephone ringing or the door slamming.	21						?
16. Child doesn't use natural inflection or intonation when he talks.	7	8	1	3		1	NR 1
17. Child doesn't answer unless spoken to in a loud voice.	17	3	1				?
18. Child stutters.		*	5	7	3	5	1

Correct responses are delineated by slashes in box.

* mark used by one respondent to indicate choice of two columns.

increases. The size of the confidence interval also depends on the standard error of $\hat{p}$ (an estimate of variability). For a binomial distribution, the standard error of $\hat{p}$ is calculated as $\sqrt{\hat{p}\hat{q}/n_t}$, where $\hat{q}$ = proportion of responses incorrect ($\hat{q} = 1-\hat{p}$). The formula for the 95% confidence interval is: 95% CI = $\hat{p} \pm Z_{.05(2)} \sqrt{\hat{p}\hat{q}/n_t}$, where $Z_{.05(2)} = t_{.05(2),\infty}$. These estimates are graphically presented in Figure 1.

It is possible to test the hypothesis that there are more correct than incorrect responses using the binomial probability distribution. The probability that the observed proportion of correct responses would be drawn, in a random sample of given size, from a population with equal numbers of correct and incorrect responses is calculated. Only when this probability is less than or equal to .05 can we conclude that there are significantly more correct than incorrect responses. The smaller the sample, the more striking the difference must be in order to conclude significance. With a sample composed of 22 respondents, 16 or more must be correct in order to conclude that there are significantly more correct than incorrect.

Conversely, we could test for significantly more incorrect than correct responses. In this case, if six or fewer out of 22 are correct, we can conclude that there are significantly more incorrect than correct.

Table 5 also shows the probability that the proportion of incorrect responses ($\hat{q}$) is greater than the proportion correct ($\hat{p}$). For all those less than or equal to .05, we can conclude that $\hat{p}$ is greater than $\hat{q}$.

Table 5. Statistical analysis of responses to the Pediatric Speech and Language Referral Survey, Section C.

ITEM NO.	NO. CORRECT	$\hat{p}$	95% CI ($\hat{p} \pm$)	PROB. $\hat{q}>\hat{p}$	CONCLUDE $\hat{p}>\hat{q}$?
1	8	.36	.20	.93	no
2	11	.50	.21	.58	no
3	1	.05	.09	.99+	no
4	10	.45	.21	.74	no
5	12	.55	.21	.42	no
6	7	.32	.19	.97	no
7	7	.32	.19	.97	no
8	15	.69	.19	.07	possibly
9	1	.05	.09	.99+	no
10	7	.32	.19	.97	no
11	6	.27	.19	.99	no
12	12	.55	.21	.42	no
13	7	.32	.19	.97	no
14	10	.45	.21	.74	no
15	21	.95	.09	.01-	yes
16	8	.36	.20	.93	no
17	20	.91	.12	.01-	yes
18	3	.14	.14	.99+	no

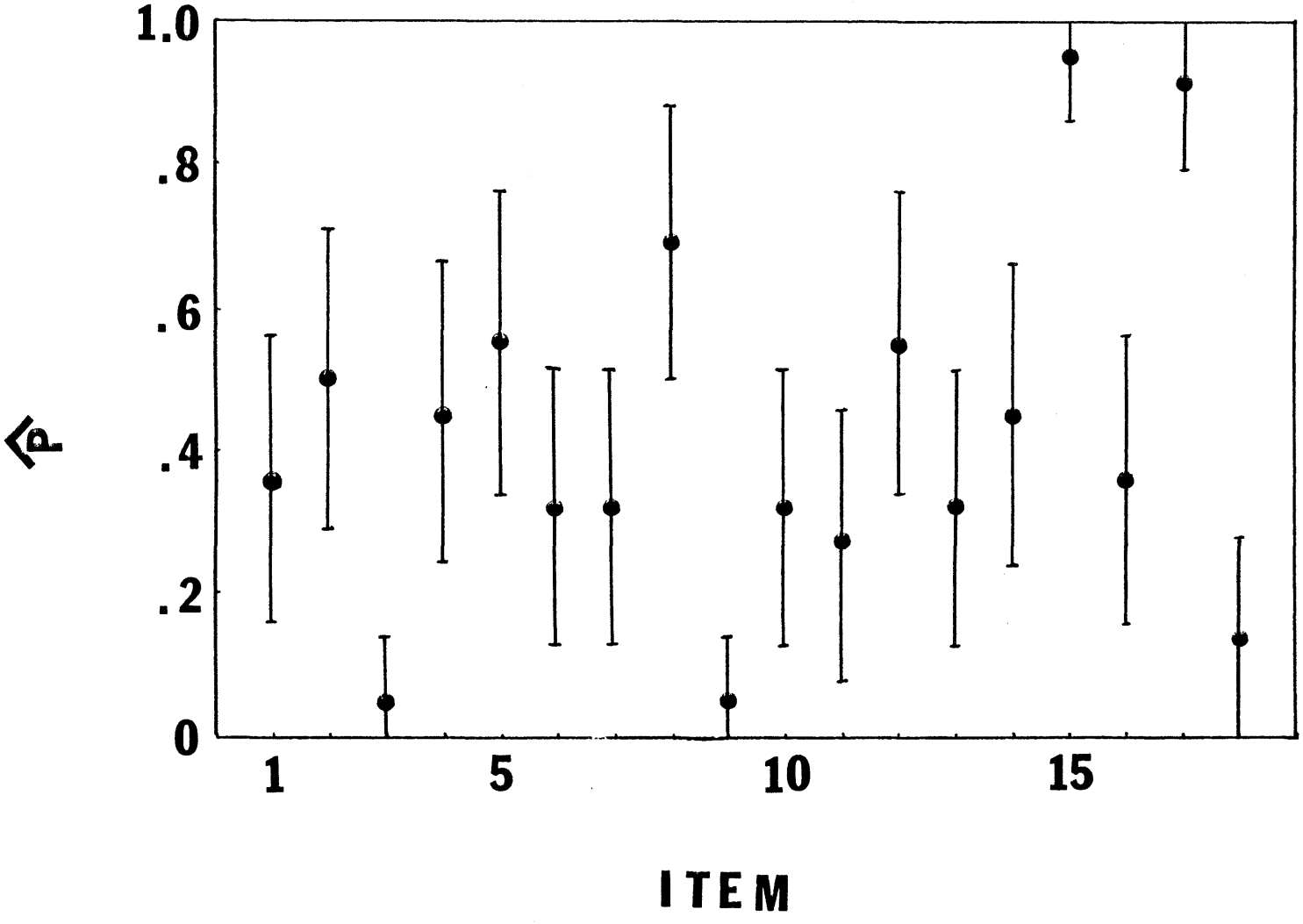

Figure 1. Proportion correct responses ($\hat{p}$) and 95% confidence interval (CI) are shown for each item.

Chapter 5

DISCUSSION

The results of Section A of the questionnaire indicate that most of the physicians who responded to the survey in this study do not use speech and lagnuage screening tests. Possible explanations for this may be time pressure of the physician, lack of training, not keeping up with the literature, lack of awareness of the significance of speech and language development, or perhaps concern over alarming parents.

From the results of this survey, it appears that the pediatrician is more attuned to the importance of hearing than to overall speech and language norms. Two of the three items in Section C dealing with hearing had the highest correct response rate (Items 15 and 17). Interestingly enough, these were the only two items for which there were significantly more correct responses than incorrect. This information correlates well with the observation that the pediatricians in this study nearly all do hearing screening in their offices. Eighteen out of 22 respondents (82%) indicated that they do hearing screening. Most of them said they do audiometry for the screening procedure. Only one mentioned an informal process such as whispered voice as the means of screening.

For most of the items in Section C one could not say that either correct responses or incorrect responses were in

the significant majority. In several of these instances one might find the proportion of correct responses in a significant majority or in a significant minority if the size of the sample had been larger. With a sample of only 22 respondents, one often is unable to detect a difference between the proportion of correct and incorrect responses to a particular item, even though such difference may in fact exist in the population from which the sample came. It should be noted, however, that the total population of pediatricians in the area studied is quite small and the sample being analyzed represents fully 50% of this population.

Except for the two items showing a significant majority of correct responses, analysis of the responses to the items in Section C shows that the majority of errors are in the column adjacent to the correct column and on the younger side. This could be interpreted to mean that physicians are really sensitive to speech and language acquisition. However, the physicians in this study responded without exception that they refer between 0% and 5% of their caseload for speech and language evaluation. The literature indicates that the normal incidence of disorder is at least 5% to 15% of the childhood population. Thus, there is a discrepancy between the rate of referral as reported by the physicians and the actual incidence of disorder as established in the literature. In addition, if the pediatricians actually referred at the

ages indicated on their questionnaires the result would be overreferral. In other words, the referral rate would be considerably higher than the 0% to 5% which they indicate in their responses. There are several explanations for this discrepancy. Perhaps some did not read the instructions carefully and were listing acquisition ages rather than the referral ages as requested. Perhaps some were not sure and preferred to be on the safe side.

Items 3, 9, and 18 had a significantly higher proportion of incorrect responses than correct ones (see Table 5). It is possible that one or two of these items were not clearly worded so that the intent of the question was not clear. This would seem doubtful in the case of Item 18, however. It is difficult to see how the working of this statement could be misinterpreted. It appears that the pediatrician develops concerns about dysfluency quite early and is unsure of the appropriate age for referral.

As indicated earlier, many individual items showed intermediate proportions of correct responses not significantly different from 50%. This could be explained by either of two situations or a combination of them. First, approximately half of the physicians could be responding with nearly all correct answers while the other half was nearly all incorrect. Second, all of the physicians could be 50% correct with these responses well distributed.

The respondent analysis seemed to indicate that the second situation is predominant; namely, that there is wide variation in physician awareness of speech and language landmarks. Of the items in Section C, the number of responses on individual questionnaires ranged from three to 12 correct. Four respondents had only three correct while seven had 11 or 12 correct. Four respondents had only three correct while seven had 11 or 12 correct. Eleven of 22 physicians had fewer than 50% correct, and three had exactly 50% correct. The remaining eight respondents had greater than 50% correct.

One concern of this researcher was the possibility that the only respondents or the majority of respondents would be physicians who were well acquainted with the norms, while those who were not well acquainted with the norms would not respond. The results, therefore, would be biased toward a higher proportion of correct responses. The data, however, are widely varying and seem to be well distributed within the possibilities. Thirteen of the 18 items had responses in four or more age categories.

Conclusion

The proportion of physicians responding correctly was not higher than the proportion responding incorrectly to test items. Thus, the hypothesis is rejected that there would be more responding correctly than incorrectly at the .05 level of confidence. However, it is apparent from the nature of

their responses that although physicians are aware of the development of speech and language, they appear to be unsure of the actual developmental age ranges and the appropriate referral ages. If the physicians actually use the criteria they purport there would be a significant overreferral rate.

Suggestions for Further Study

Further investigations should be done to see if replication of results would be obtained using a larger sample or a different geographical area. Other suggestions would include rewording or deleting the items that lacked internal consistency and to work out statistical formulas that would account for degree of error.

Summary

Forty-five pediatricians were mailed a questionnaire that had been developed utilizing speech and language development norms taken from pediatric literature. Twenty-two pediatricians responded to the questionnaire. Item analysis was performed to determine if a greater proportion of responses were correct than incorrect. Three items were found to have a significantly higher proportion of incorrect responses while in two items there were significantly more correct responses than incorrect. The latter two items dealt with hearing. It would appear that many pediatricians are aware of speech and language development but are not sure

of the age ranges of acquisition for these landmarks. Also, it appears that physicians are more tuned to developmental landmarks in the area of hearing than in speech and language.

REFERENCES

Bailey, E. N., Kiehl, P. S., Loughlin, H. H., Metcalf, T. J., Jain, R., and Perrin, J. M. Screening in pediatric practice. Pediatric Clinics of North America, 1974, 21, 123-165.

Bain, D. J. G. Methods used by general practitioners in developmental screening of preschool children. British Medical Journal, 1977, 2, 363-365.

Bax, M., and Hart, H. Health needs of preschool children. Archives of Diseases in Childhood, 1976, 51, 848-852.

Brown, J. M., Darley, F., and Gomez, M. R. Disorders of communication. Pediatric Clinics of North America, 1967 14, 725.

Burgi, E. J., and Matthews, J. Disorders of speech. Journal of Pediatrics, 1963, 62, 15-19.

Butler, N. R., Peckham, C., and Sheridan, M. Speech defects in children aged seven years: A national study. British Medical Journal, 1973, 1, 253-257.

Carr, J., and Stephen, E. Pediatricians and developmental tests. Developmental Medicine and Child Neurology, 1964, 6, 614-620.

Damarin, F. Bayley Scales of Infant Development. In, The Eighth Mental Measurements Yearbook, Oscar Krisen Buros, Ed. Highland Park, New Jersey: Gryphon Press, 1978, 1, 291-293.

Drumwright, A. F. Speech and Language. In, Frankenburg, W. L. and Camp, B. W. Pediatric Screening Tests. Springfield, Illinois: Charles C. Thomas, 1975.

Eisenson, J. Disorders of language in children. Journal of Pediatrics, 1963, 62, 20-24.

Fiedler, M. F., Lenneberg, E. H., Rolfe, U. T., and Drorbaugh, J. E. A speech screening procedure with three-year-old children. Pediatrics, 1971, 48, 268-276.

Frankenburg, W. K. Pediatric screening. Advances in Pediatrics, 1973, 20: 149-175.

Frankenburg, W. L., Dick, N. P., Carland, J. Development of preschool-aged children of different social and ethnic groups. Implications of developmental screening. Journal of Pediatrics, 1975, 87, 125-132.

Frankenburg, W. K. and Dodds, J. B. The Denver developmental screening test. Journal of Pediatrics, 1967, 71(2), 181-191.

Frankenburg, W. L., van Doorninck, W. J., Liddel, T. N., and Dick N. P. The Denver prescreening developmental questionnaire (PDQ). Pediatrics, 1976, 57, 744-753.

Friedman, R. J. The young child who does not talk: Observations on causes and management. Clinical Pediatrics, 1975, 14, 403-406.

Gesell, A. L. and Amtruda, C. S. Developmental Diagnosis, 2nd edition. New York: Paul B. Hoever, Inc., 1954.

Godfrey, C. M., and Ward, J. F. Common speech problems encountered in general practice. Canadian Medical Association Journal, 1962, 87, 1236-1239.

Halfond, M. and Olmsted, R. The relationship of pediatrics to non-medical professions. Journal of Pediatrics, 1963, 62 (1), 3-4.

Hixson, P. H. Recognizing delayed language development in children with hidden hearing impairment. Pediatric Annals, 1980, 9(1), 55-60.

Holm, V. A., and Kunze, L. H. Effect of chronic otitis media on language and speech development. Pediatrics, 1969, 43 833-839.

Ingram, T. T. S. Delayed development of speech with special reference to dyslexia. Proceedings of the Royal Society of Medicine, 1963, 56, 199-203.

Johnson, O. G. Tests and Measurements in Child Development: Handbook II. San Francisco: Jasseu-Bass Publishers, 1976, 1, 215.

Knobloch, H., Pasamanick, B., and Sherard, E., Jr. Developmental screening inventory for infants. Pediatrics, 1966, 38(6),IIm 1095-1110.

Kulig, S., and Baker, K. Preliminary field testing of the Physician's developmental quick screen for speech disorders (PDQ). A five-minute procedure for testing children six months to six years. Clinical Pediatrics, 1976, 15(12), 1146-1150.

Kulig, S., and Baker, K. The physician's developmental quick screen for speech disorders (PDQ). Department of Pediatrics, University of Texas Medical Branch at Galveston, 1975.

Kulig, S., and Baker, K. The physician's developmental quick screen for speech disorders (PDQ). Department of Pediatrics, University of Texas Medical Branch at Galveston, 1975.

Leavitt, S. R., Gorman, H., and Harvin, D. Use of developmental charts in teaching well-child care. Pediatrics, 1963, 31, 499.

Lenneberg, E. T. Biological Foundations of Language. New York: John Wiley and Sons, 1967.

Lessler, K. Some considerations pertinent to the health screening of children: The responsibility of pediatrics is much more than biological. Clinical Pediatrics, 1973, 12, 656-659.

Levine, M. I. A pediatrician's view. Pediatric Annals, 1980, 9, 5-9.

Lillywhite, H. General concepts of communication. Journal of Pediatrics, 1963, 62(1), 5-10.

Lillywhite, H. S., Young, N. P. and Olmsted, R. W. Pediatrician's Handbook of Communicative Disorders. Philadelphia, Pennsylvania: Lea-Febger, 1970.

MacKeith, R. Children who are not speaking at three years of age. Developmental Medicine and Child Neurology, 1977, 19, 573.

Marlowe, W. B. The pediatrician and the child with a communication disorder. Clinical Pediatrics, 1973, 12, 675-677.

NINDB: Human communication: The public health aspects of hearing, language, and speech disorders, Monograph No. 7. Bethesda, Maryland: National Institute of Neurological Diseases and Blindness, Department of Health, Education and Welfare, 1968.

NINDS: Human communication and its disorders: An overview, Monograph No. 10. Bethesda, Maryland. National Institute of Neurological Diseases and Strokes, Department of Health, Education, and Welfare, 1972.

Olmsted, R. W. Symposium on disorders of communication: Speech. Journal of Pediatrics, 1963, 62(1), 1-2.

Preston, M. S. Psycholoinguistics and the evaluation of language function. Pediatric Clinics of North America, 1973, 20, 79-88.

Richardson, S. O. Pediatric evaluation of speech and hearing disorders. Clinical Pediatrics, 1964, 3, 150-152.

Rose, F. C. Speech disorders in children. London Clinic Medical Journal, 1970, 11(2), 39-46.

Rousseau, F. Speech and language characteristics of a learning disabled child. Paediatrician, 1974, 3(6), 325-328.

Schwartz, A. W., and Murphy, M. W. Cues for screening language disorders in preschool children. Pediatrics, 1975, 55, 717-722.

Sheridan, M. D. The stycar language test. Developmental Medicine and Child Neurology, 1975, 17(2), 164-174.

Solomons, G. Prevalence of speech and hearing problems in a child development clinic population. Clinical Pediatrics, 1970, 9(7), 384-389.

Stevenson, J., and Richman, N. The prevalence of language delay in a population of three-year-old children with its association with general retardation. Developmental Medicine and Child Neurology, 1976, 18, 431-441.

Stewart, A. Disorders of language and articulation in children. Public Health, 1969, 83, 113-121.

Templin, M. D. Development of speech. Journal of Pediatrics, 1963, 62(1), 11-14.

Thorpe, H., and Werner, E. Developmental screening of preschool children: A critical review of inventories used in health and educational programs. Pediatrics, 1974, 53, 362.

Wyatt, G. L. Speech and language disorders in pre-school children: A preventative approach. Pediatrics, 1965, 36, 637-647.

Appendix A-1

PEDIATRIC SPEECH AND LANGUAGE REFERRAL SURVEY

SECTION A

Listed below are developmental screening instruments which might be used to screen speech and language development. Place an x in the appropriate space on the scale to indicate what proportion of your caseload is screened with one of these instruments at some time during the child's pre-school office visits. Parentheses beneath screening instrument indicates author(s).

up to:	NONE 0%	SOME 30%	MANY 60%	MOST 90%	ALL 100%
1. Bayley Scale (Bayley)					
2. Denver Developmental Screening Test (Frankenburg & Dodds)					
3. Denver Prescreening Developmental Questionnaire (Frankenburg, van Doorninck, Liddel, & Dick)					
4. Developmental Screening Inventory (Knoblock, Pasamanick, Sherard)					
5. Griffiths Scale (Griffiths)					
6. Physicians Developmental Quick Screen (PDQ) (Kulig)					
7. Speech Evaluation Form (Lenneberg, Fiedler, Rolfe, Drorbaugh)					
8. Stycar Language Test (Sheridan)					
9. Reynell Development Language Scale (Reynell)					
10. Developmental Schedule (Gesell)					
11. Other (please specify)					
12. No formal test, I prefer to screen by observation.					

SECTION B

1. Approximately what percentage of children that you see do you refer for speech and language evaluation? (please check) 0-5%____ 6-10%____ 11-15%____ 16-20%____

2. Where do you usually refer your patients with speech problems? (please check all that apply)
   a. Private speech pathologist_____
   b. Language, Speech & Hearing Clinic_____
   c. Public School_____
   d. Psychologist_____
   e. Other (please specify)_____

3. Do you do any type of hearing screening in your office? Yes____ No____
   If yes, what type(s) of hearing tests do you usually do?_____

Appendix A-2

SECTION C

Listed below are complaints that a parent might make or observations that a physician might note during an office visit. Please check the appropriate column to indicate at which age you would consider the following behaviors to warrant referral for a speech and language evaluation.

	12-24 mo.	25-36 mo.	37-48 mo.	49-60 mo.	61-72 mo.	72-up mo.	not sure
1. People can't understand what the child is saying.							
2. Child doesn't say correctly simple words like man, boy, knee, pee.							
3. Child sounds mushy on words like chair, shoe, George, sauce.							
4. Child omits sounds from his words leaving mostly vowel sounds.							
5. Child doesn't name familiar objects in his environment.							
6. When spoken to, child doesn't recognize his name or names of family members.							
7. Child doesn't put words together to express his wants.							
8. Child uses telegraphic speech such as "go store" or "mommy cookie".							
9. Child uses unusual word order in sentences, such as "I not was working".							
10. Child is unable to respond with his correct name when asked to do so.							
11. Child has difficulty following directions without cues, such as "Give mommy your shoes".							
12. Child primarily gestures instead of speaking.							
13. Child uses only 3 or 4 words per sentence.							
14. Child echoes everything that is said.							
15. Child appears not to hear noise such as the telephone ringing or the door slamming.							
16. Child doesn't use natural inflection or intonation when he talks.							
17. Child doesn't answer unless spoken to in a loud voice.							
18. Child stutters.							

APPENDIX B

LOMA LINDA UNIVERSITY

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LA SIERRA HEARING, LANGUAGE AND SPEECH CENTER
LA SIERRA CAMPUS
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714/785-2157

May 13, 1981

Speech pathologists receive referrals concerning children who have speech and language problems from many sources. One of these sources is the family pediatrician. A review of the literature shows few studies dealing with the frequency and the basis on which pediatricians refer such children.

Since both of our disciplines are interested in the total welfare of our patients, I have chosen as a topic for my Master's thesis to study how often and on what basis pediatricians make referrals to speech pathologists.

Because of your interest in children and their welfare, I would greatly appreciate your participation in this endeavor. It is people such as yourself who have the expertise to contribute significantly to this study.

Enclosed is a brief questionnaire designed to elicit this information. It will take about 10-15 minutes of your time to complete. I would appreciate your completing the questionnaire and returning it to me by June 3 because of deadlines I must meet. I will be happy to share findings with you if you so indicate.

In order to assure anonymity of participants, each questionnaire will be processed by number rather than by name. Thus it will be impossible for anyone to identify individual responses. Please be assured that your name will not be used in the thesis nor in any subsequent publications.

Thank you very much for your consideration and help in making this study possible.

Sincerely,

Janet Bradley